FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World
Founder and Editor: STANLEY SPOONER
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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :—

1925

Apr. 24		Commander C. D. Burney, C.M.G., M.P., R.N.: "The Position of the Airship in Aerial Transport," before I.Ae.E.
Apr. 30		Wilbur Wright Lecture, Rear-Admiral D. W. Taylor: "Some Aspects of the Comparison of Model and Full-Scale Tests," before R.Ae.S.
May 8		Capt. W. H. Sayers, Hons. Member: "A Resume of Achievements in Aviation during the Past Year," before I.Ae.E.
May 7		Aero Golfing Soc. Spring Meeting, Worplesdon.
May 20		Visit to the National Physical Laboratory, Teddington, by I.Ae.E.
May 21		Aero Golfing Soc. Match, Cassiobury Park.
May 29		Aero Golfing Soc. Match, Oxhey.
June		Race Meeting at Hendon Aerodrome.
June 6		Visit to Croydon Aerodrome, by I.Ae.E.
June 7		Gordon Bennett Balloon Race, Brussels.
June 25		Aero Golfing Soc. Match, Mid-Surrey.
July 3–4		King's Cup Race.
Sept. 19–28		F.I.A. Conference at Prague.

EDITORIAL COMMENT.



BY the time this week's issue of FLIGHT reaches our readers the Fokker demonstration about which so much has been written will probably have taken place, and will doubtless have received a great deal of publicity. Without wishing in any way to detract from Mijnheer Fokker's achievement, we think it is only fair that it should be pointed out that research into the problem of control at or above the angle of maximum lift has been carried out in Great Britain for many years, and that, whatever may be our temporary position as regards air power, in the matter of elucidating the problems of spinning and questions connected therewith, we undoubtedly hold a leading position. Private firms no less than the Royal Aircraft Establishment at Farnborough have experimented with full-size machines, and in the wind tunnels model research has been carried out most systematically. It is, of course, well known that the Fairey Aviation Company, for instance, have worked upon the problem of control at stalling angle for several years, and a considerable measure of success has been attained. Thus, the Fairey "Flycatcher," fitted with large wing flaps and having fairly large tail surfaces, is capable of descending at a very steep angle, its fuselage remaining sensibly horizontal, and the machine being under perfect control. Avro machines have been used for similar experiments for several years, and just recently the International Commission for Air Navigation visited the R.A.E. and there witnessed flights on an Avro specially fitted for control at stalling speed. In the particular Avro the Handley Page leading edge slot had been combined with the wing-flap movement, a combination which wind-tunnel tests have shown to be very effective. It will thus be seen that we have in this country machines which are under perfect control at angles considerably above the stall, and some of these are in daily and extensive use by the R.A.F. The merit of the Fokker demonstration appears to lie in the fact that it will take place on a heavy commercial machine, and in this class we have no machine to

Control and Stalling

compete with it in the matter of stalled flight. That, however, is in no way due to ignorance of the subject, and it is as well to bear this in mind before developing undue enthusiasm.

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Brussels–Kinshasa

The Belgian flight from Brussels to Kinshasa has, as briefly recorded in FLIGHT last week, been successfully accomplished, and reflects the very greatest credit on all concerned—most, of course, on Thieffry and his gallant pilot Roger, and their engineer, de Bruycker. To them and to Belgian aviation in general we would extend our heartiest congratulations. The flight has not, we fear, been given as much recognition in the press as it deserved, but that was probably because unavoidable delays served to lessen the interest somewhat, coupled with the fact that the later stages of the journey lay over regions where news is not over-rapidly handled.

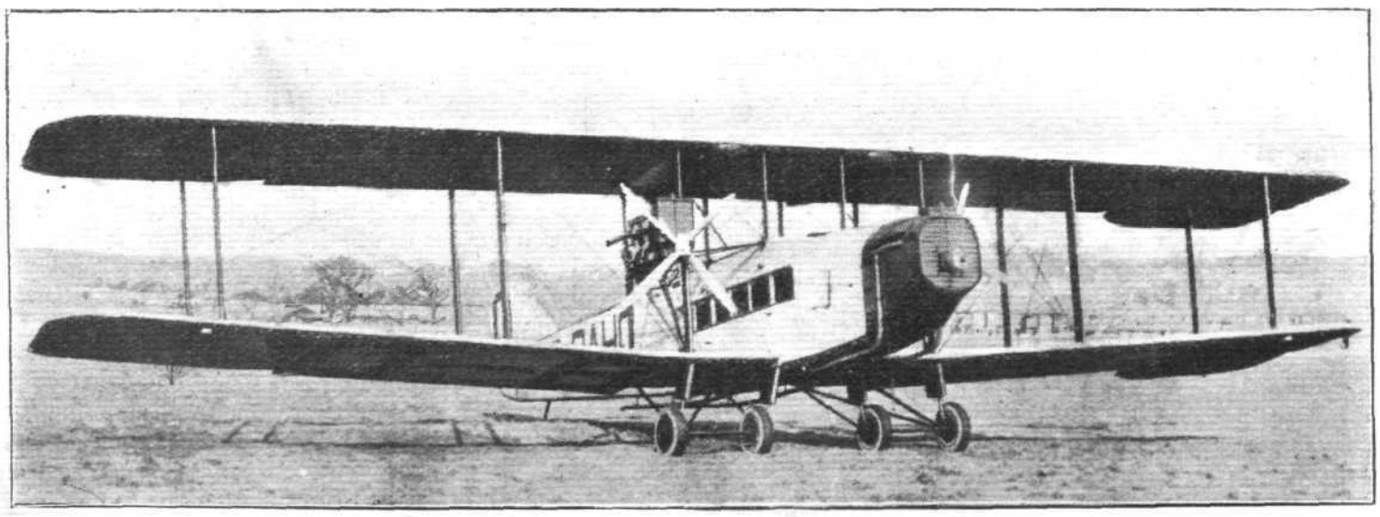
To us and to all interested in home products it must be a matter for satisfaction that the flight was carried out on a British machine and with British engines. We are aware, of course, that the O-BAHO "Princesse Marie-Jose" was built in the S.A.B.C.A. works in Belgium under licence, but as the Handley Page W.8F is certainly of British design and the Congo machine was built to the British drawings, we feel justified in regarding it as a British aeroplane. The W.8F is engined as standard with one Rolls-Royce "Eagle" engine in the fuselage and two Siddeley "Pumas" on the wings. These were obtained from the Aircraft Disposal Company, who thus again share in a great flight, and, so far as can be gathered from Thieffry's log-book, the engines gave no trouble whatever, in spite of being called upon to work under very trying conditions. The flight took a good deal longer than had been expected, but this was due to no fault in machine or engines, which behaved perfectly throughout, but partly to strong head winds and partly, and even more, to the fact that time after time the Belgian aviators had to wait for supplies of petrol.

The O-BAHO left Brussels aerodrome on February 12 and arrived at Kinshasa on April 3, having covered a distance of 8,500 kms. (5,300 miles) in a total flying time of, roughly, 75 hours. There was no attempt to make a particularly rapid journey, and there can be not the slightest doubt that with the route properly organised the flight could be made in something like a week. The forward organisation does not, however, appear to have been very thorough, and the Belgians seem to have trusted considerably to luck and to the kindness of the various French authorities in supplying them with fuel and oil in out-of-the-way places. These were, of course, willingly given, and Thieffry speaks very highly of the assistance which everyone was ready to offer.

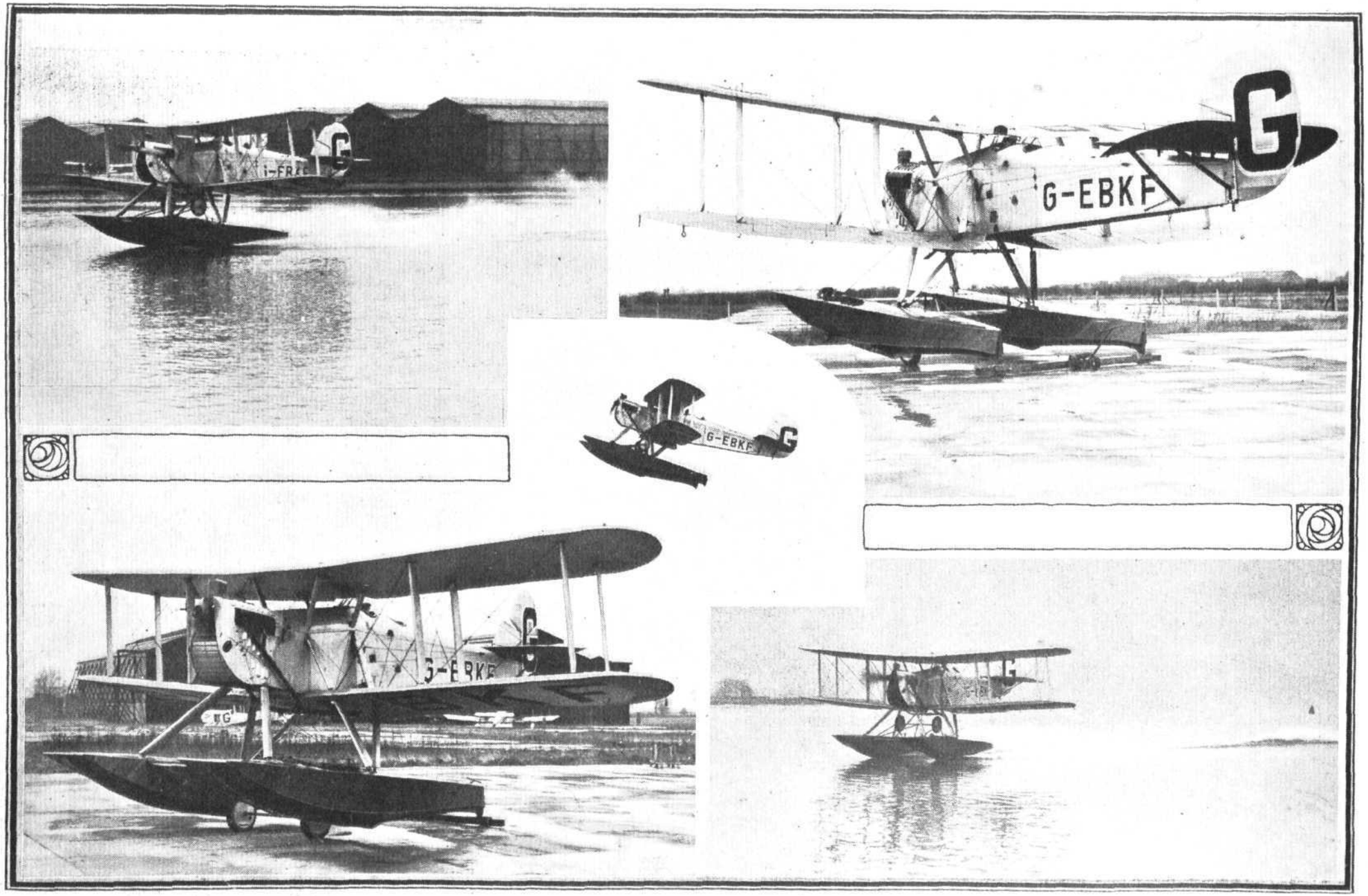
So far but little information is available relating to the condition of machine and engines beyond the entry frequently occurring in the log that the machine was examined and found to be in perfect order, and the engines started easily and ran smoothly and perfectly. Once, indeed, we do find a statement in the log that the port "Puma" was vibrating very badly, but the account of the landing and subsequent examination reveals the fact that the vibration was due, not to any engine defect, but to a cracked and split propeller, which necessitated a long wait for a spare propeller. The moral of this appears to be that for work in the tropics metal propellers are essential.

The navigation of Thieffry appears to have been very good, and on several occasions the machine flew for several hours above the fog without seeing the ground, and yet kept reasonably well to its course. Thieffry is full of praise for the le Prieur "Navigraphe," which enabled him to keep his course in the difficult circumstances. By its use the machine was never far off its course, although at times a landing was made a few kilometres before the object was reached.

Altogether the flight seems to have been one of considerable interest and of great practical value. It was carried out in connection with the projected service in Belgian Congo, where landing grounds are few and far between, and where, consequently, it is essential to reduce the risk of forced landings. Hence the Handley Page W.8F was chosen. The Brussels-Kinshasa flight seems to show that this choice was a wise one.



THE BRUSSELS-CONGO FLIGHT: This photograph shows the three-engined Handley Page aeroplane in which Lieut. Thieffry and his companions flew from Brussels to Congo. The central engine is a Rolls-Royce "Eagle IX," while the two wing engines are Siddeley "Pumas." The machine was fully described and illustrated in "FLIGHT" on May 1, 1924. This particular machine was built under licence in Belgium by the S.A.B.C.A. Company.



SCHOOL WORK AT BROUGH: These photographs, secured on a recent visit to the North Sea Aerial and General Transport Company's station, show the Blackburn "Dart" seaplane, fitted with Napier "Lion" engine, which is used for seaplane training. It should be noted that although the machine is not an amphibian in the usual sense of the term, the landing-wheels are carried on board, but are raised clear once the machine has taken the sea. They are lowered for transport on land and in launching and coming in. The upper left-hand photograph shows the "Dart" taking off, piloted by Mr. Woodhouse, and in the lower right-hand picture it is seen alighting. The other photographs are self-explanatory.

FLIGHT

THE BLACKBURN FLYING SCHOOL

A Few Impressions of a Visit to Brough

FOR some time past the flying school operated at Brough, on the Humber, by the North Sea Aerial and General Transport Company has been in full swing, and as the work being carried out and the types of machines in use are of considerable interest, it is thought that a few impressions of a visit which we paid to the station recently may be welcome. The North Sea Aerial and General Transport Company, it should be mentioned, is a subsidiary company of the Blackburn Aeroplane and Motor Company, of Leeds, and its general manager is Capt. Norman Blackburn.

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TWO BLACKBURN SCHOOL MACHINES: On the left, the "Dart" seaplane, with Napier "Lion" engine; and on the right, the "Bluebird" light 'plane, with Blackburne engine.

The flying school at Brough has the distinction, among others, of being the only privately-owned seaplane training school in the country, and as such is of considerable interest, the more so as the training of seaplane pilots is, in many ways, different from and more difficult than the training of aeroplane pilots. The company has been appointed by the Air Ministry to give refresher courses to pilots of the R.A.F. Reserve, and instructional work is carried out on a number of different types of machines, ranging from the Blackburn "Bluebird" light biplane to the twin-engined "Kangaroo" and the "Dart" seaplane.

The Brough air station was, of course, a very important one during the War, and since the outbreak of peace it has seen very considerable activity, as all the various types of Blackburn machines, aeroplanes, seaplanes, and flying boats are tested here. With the establishment of the training school this activity has been still further increased, the situation of the station being such as to produce a combination not often met with, *i.e.* an aerodrome adjoining a river, so that all types of machines, including amphibians, can be flown.

Large hangars are already in existence on the ground, one of which is a huge flying shed, while in the other constructional work, erecting repairs, etc., are carried out. A number of smaller hangars house the smaller of the school machines, and on the edge of the aerodrome has been built a residential club, the Brough Aviation Club, where pupils and instructors spend their hours of rest. The club premises include mess, bar, billiard room and lounge, and usually a very happy and cheerful company is to be found in and around the club when the weather does not permit of flying. Three instructors look after the training of pupils, all being men with past experience in the R.A.F. and/or in the late R.N.A.S.

Reference has already been made to the fact that Brough is the only civilian seaplane school in the country. The

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THE BLACKBURN "BLUEBIRD" LIGHT 'PLANE: Three-quarter rear view. Note the door giving access to the cockpit.

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The Blackburn "Bluebird": In this view the undercarriage and the engine cowling, etc., are clearly shown. Note the Fairey-Reed Duralumin propeller.

machine used for training seaplane pilots is a Blackburn "Dart" with Napier "Lion" engine, several photographs of which are published herewith and on p. 223. The "Dart" is fitted with very large floats, and the photographs will show how cleanly it leaves and alights on the water. The larger photographs show the general lines of the machine, which is, it will be seen, of typical Blackburn appearance. Although the machine is not designed as an amphibian, landing wheels are fitted and are carried during flight, being raised clear when once the machine is afloat, and being lowered again before the machine is brought up the slipway. The "Dart," it will be remembered, is also produced as a torpedo-plane, a type of machine in which the Blackburn Company has specialised for many years, and as such it has to have ample control throughout its speed range (from 40 m.p.h. to over 100 m.p.h.). It is thus a singularly useful machine for school purposes, and in this connection it is of interest to note that the "Dart" seaplane is so perfectly trimmed that it is possible for the pilot to take his hands off the controls when leaving the water.

Of aeroplanes several types are in use for training, the smallest being the Blackburn "Bluebird" light 'plane built for last year's Lympne competitions, but finished too late to take part. This machine, a vertical biplane, has its two seats placed side by side, so that conversation between pilot and passenger, or between instructor and pupil, is easily possible during flight, and, moreover, the pupil can follow with his eyes every movement of the controls by the instructor. Fitted with a "Blackburne" engine (the name denotes an entirely different firm—namely, Burney and Blackburne, of Bookham, Surrey), the Blackburn "Bluebird" now flies very strongly, and is a great favourite at Brough. It is almost superfluous to say that a couple of samples of the ubiquitous Avro 504's are also included in the Brough equipment, and, by way of training pupils in flying twin-engined machines, a few tame "Kangaroos" are kept. These machines are noted for their reliability, and did excellent work during the War, when, in spite of the fact that they were land machines, they were used for patrolling over the North Sea. They are fitted with two Rolls-Royce "Eagle" engines, and are probably so well known to our readers as to render further description superfluous.

Owing to the fact that constructional work and repairs are carried out at Brough, the pupils have an excellent opportunity of becoming familiar with the engineering side of flying, a fact which is of no small importance, and which is much appreciated by the pupils.

It is no longer a secret that the North Sea Aerial and General Transport Company has for several years had its eyes on a seaplane service between North England and Scandinavia, but that during the years after the War the Air Ministry was not disposed to encourage such a scheme. It is to be hoped that with the progress since made in the design and construction of flying boats this scheme may yet materialise, as such a route could scarcely fail to be of considerable benefit, as it would reduce the journey from England to Copenhagen, for instance, from 36 hours to seven or eight hours. In that case Brough would doubtlessly assume even greater importance than it already possesses, and the brothers who were among the pioneers of British aviation would then see one of their dreams fulfilled. Many others have already come true.

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New U.S. Aircraft Carrier

America's latest aircraft carrier, the "Saratoga," was launched at Camden, New Jersey, on April 7. This vessel, which has cost £9,000,000, carries 72 aeroplanes.

An Aerial "Picture Theatre"

An interesting experiment was carried out on April 7, when a Handley Page aeroplane ascended from Croydon Aerodrome, with 12 passengers, and during half-an-hour's flight the film version of Sir Arthur Conan Doyle's "The Lost World," was "shown" on a screen fitted up in the cabin of the machine.

British Challengers for the Schneider Cup

In addition to the machines being produced by the Gloucestershire Aircraft Co., it is probable that one will also be entered by the Supermarine Aviation Works. This latter machine will be fitted with a Napier "Lion" engine.

Alan Cobham on His Indian Flight

On Tuesday, April 7, Alan Cobham gave an extremely interesting and entertaining lecture at the Aeolian Hall on his flight to Burma and back with Sir Sefton Brancker, who was, by the way, Chairman at the lecture. In introducing his pilot—the lecturer—Sir Sefton remarked that if they were to judge airmanship by the old standards of seamanship, *i.e.*, skill, ability and experience in navigating craft in any part of the world, he thought they could claim that, Alan Cobham was the greatest airman in the world. Mr. Cobham's story of the 17,000 miles' flight was illustrated by many excellent lantern slides—and many very amusing incidents of the journey were related. Referring to the suggestion that the monotony of the desert renders it almost impossible to fly over, Mr. Cobham stated that "if the monotony of the desert consists of a blue sky, visibility for about 100 miles, and general perfect weather conditions, with no hills, just a track to follow, then the average cross-Channel pilot will consider flight over the Syrian desert a rest cure."

Institution of Aeronautical Engineers

We would remind our readers of the meeting of the Institution of Aeronautical Engineers to be held at the Engineers Club (Coventry Street) on Friday, the 24th inst., at 6.30 p.m., when Commdr. C. D. Burney, C.M.G., M.P., R.N., will lecture on "The Position of the Airship in Aerial Transport." Cinematograph pictures will be shown in illustration of the lecture.

SOME "AVIS" SCHOOL MONOPLANES

Austrian Firm Starts Original Construction

GRADUALLY the countries which commenced by obtaining machines from abroad, or built them at home under licence, are taking up original design, and in many instances some very interesting machines have resulted. In Austria certain firms were, of course, in existence before the War, but these appear to have disappeared, or at any rate to have closed down their aircraft sections. In their place a new Austrian aircraft firm has come into being since the War, and in spite of very great difficulties, mainly financial, has already produced some four or five different types of aeroplanes. The name of this firm is the "Avis" Aircraft and Automobile Works, Ltd., or, to give it its Austrian name, the *"Avis" Flugzeug und Autowerke G.M.B.H.* This firm has offices in Vienna and works at Brunn am Geb., while the aerodrome is at Aspern, a name that will be familiar from the early days of flying.



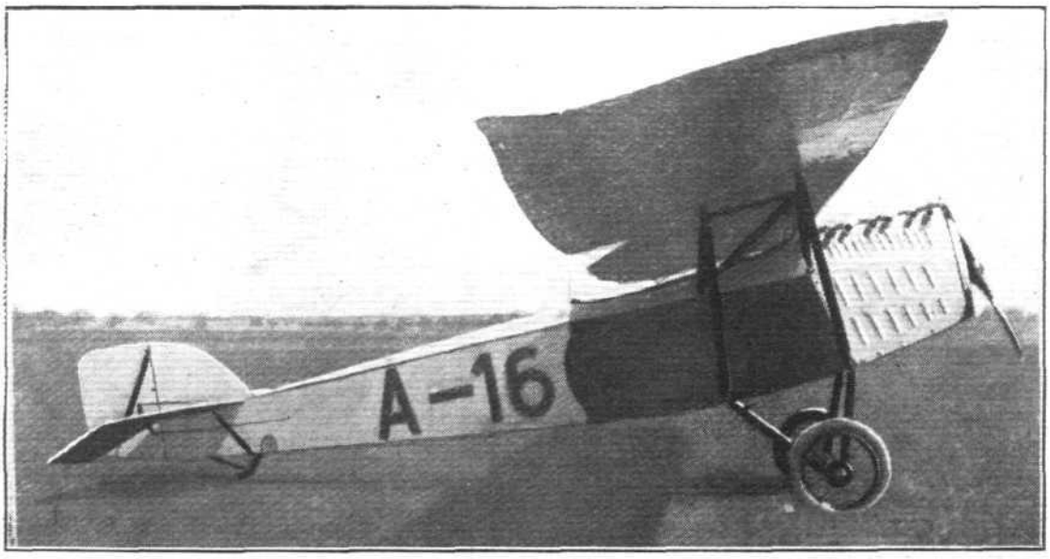
The "Avis" B.S.I: Side view.

The first types to be produced by the "Avis" firm were school monoplanes, and it is these which form the subject of the accompanying illustrations. More recently a more ambitious machine has been produced, *i.e.*, a three-engined passenger carrier known as the "Avis" B.G.V. I. A description of this machine is, however, reserved for another occasion.

Differing but little in detail construction, the following description will, in the main, apply to all three types, and where any considerable differences occur they will be indicated in the text. Generally speaking, the "Avis" construction may be characterised as being of the well-known Fokker type, *i.e.*, wood wings covered with ply-wood and welded steel tube fuselage. Aerodynamically also there is some resemblance to the Fokkers in that the school machines are all parasol monoplanes, but the wing supports differ somewhat from those employed by the famous Dutch designer.

Two almost identical types are the B.S. I and the B.S. II, both of which are fitted with six-cylinder water-cooled engines. In the former, however, the two cockpits merge into one, presumably in order to facilitate instruction work, whereas in the B.S. II there are two separate cockpits arranged in the more usual manner. Slight differences are also noticeable in the exhaust arrangement, and to somewhat smaller extent in the engine cowling.

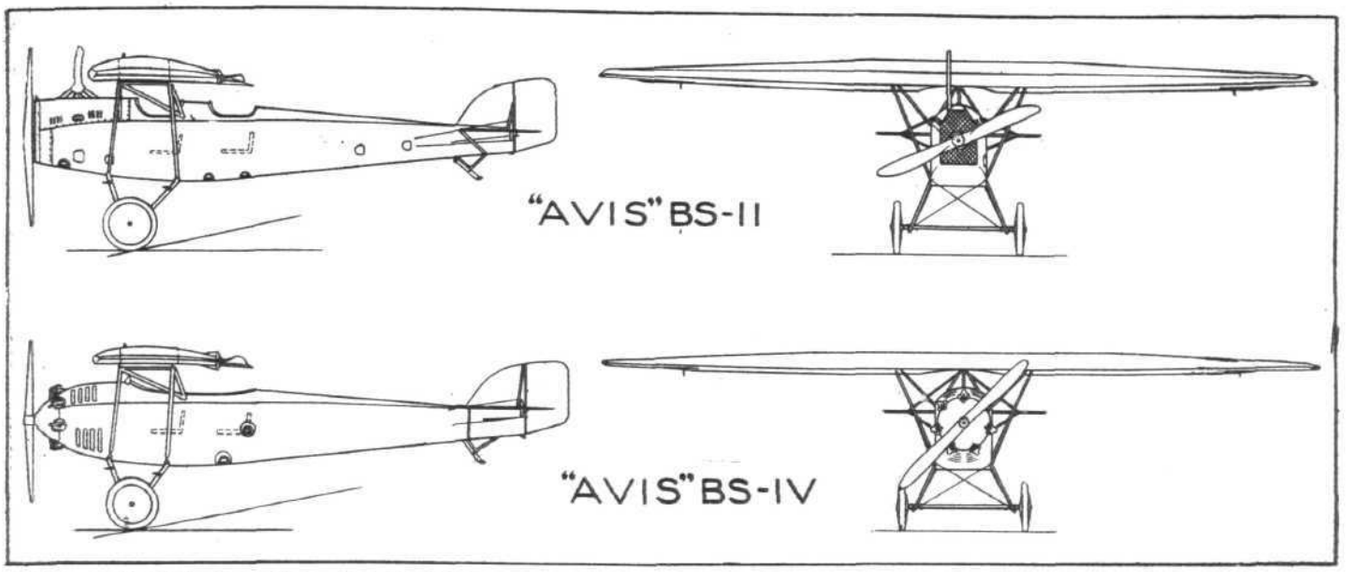
The fuselage is, as already mentioned, of the welded steel tube type, with fabric covering. The engine, which can be any 100 h.p. water-cooled six-cylinder-in-line, is mounted on a steel tube structure, and is separated from the cockpits by the usual fireproof bulkhead. No petrol is carried in the fuselage, the main petrol tank, mounted in the wing and over the centre of gravity, being also the service tank, so that no petrol pressure is necessary. The oil tank, however, is mounted beside the engine. A nose radiator, so mounted as to be readily removable, is secured to the forward ends of the four longerons.



The "Avis" B.S. II is similar to B.S. I, but the two cockpits are not separated, and the engine cowling is slightly different.

As the machines are mainly intended for school work, dual control is provided. The duplication includes all controls, even those of the engine, but provision is made whereby the instructor can make the pupil's throttle-control inoperative.

The wing construction consists of two box spars with spruce flanges and ply-wood sides. The ribs are located on the spars without the use of screws or nails through the ribs, and the whole is then covered with ply-wood. The



TWO "AVIS" SCHOOL MACHINES: The B.S. II is fitted with a 100 h.p. water-cooled engine, and the B.S. IV with an 80 h.p. Siemens radial air-cooled engine. General arrangement drawings.

plan form of the wing is similar to that of the Fokkers, and small ailerons with turned-up tips are fitted to false spars. The wing is supported from the fuselage by streamline steel tubes, one pair running to upper and one to lower longerons on each side. The triangulation thus obtained is further assisted by a central cabane, whose legs converge on the centre line of the wing. It should be mentioned that the wing struts are provided with left- and right-hand bolts for adjusting the angle of incidence. The trailing edge is cut out in the centre to give a better view, but one is somewhat doubtful as to the effect of this large cut-out on the aerodynamic characteristics of a thick high-lift wing.

The tail plane, elevators, rudder and fin are of steel tube construction, fabric covered, and the tail plane is adjustable, although not in flight. The tail appears on the small side, compared with British practice.

The undercarriage, with streamline steel tube struts, is of normal type, with rubber shock absorbers.

Another school machine of very similar type is the B.S. IV, which differs from those just described mainly in being fitted with a Siemens-Halske radial air-cooled engine.

IN THE HOUSE OF LORDS

THE Duke of Sutherland on April 7 asked the Government whether, in view of the recent unfortunate aeroplane accident at Croydon Aerodrome, it would not be advisable to allow a portion of the sum voted for research to be used by aeroplane constructors, under the control of the Air Ministry, for experimental research with regard to new designs, so that a great deal of progress might be made and many of the difficulties which surround the development of new designs by aeroplane constructors might be removed.

The Marquess of Salisbury, Lord Privy Seal, said that a good deal of work and money was being expended by the Government on research in aeroplane construction. The accident at Croydon was due in the main to engine failure. How that failure absolutely arose would probably never be known. A certain tendency in the machine to spin no doubt contributed to the disaster. Pure research in the matter of engines was being carried out by the Air Ministry, and experimental research, not only by the Air Ministry, but also by private firms assisted by public money. A sum of £200,000 a year was being spent on engine research alone. Trials of the engine when the machine was completed were carried out by the Air Ministry. Research work on a large scale was also going on in regard to the design of machines, and the machine when completed was put to practical tests. In addition to the £200,000 which was being used for research in engines, £350,000 a year was expended on analogous research in the matter of the machines themselves. The Air Ministry was in correspondence with the Society of British Aircraft Constructors, and the suggestion had been made that there should be an annual conference with the Aeronautical Research Committee of the Ministry, at which the programme of research suitable for commercial machines should be settled. He thought he had said enough to show that the Air Ministry was fully alive to the importance of research.

Military and Civil Aviation in Egypt

SCHEMES have been submitted to the Egyptian Council of Ministers providing for the establishment of military and commercial air services. The latter will be under the Ministry of Communications, and will carry goods and passengers to various parts of Egypt and adjoining countries. The military section will be in two parts, one to protect the frontiers and the other attached to the coastguards, to prevent smuggling. A school of aviation is to be founded at Heliopolis, with British instructors, and aerodromes will be established at Heliopolis, Elamrieh, and Kantara. Two other naval aerodromes are to be erected at Alexandria and Port Said.

An Air Route for Central Africa

As the result of negotiations with a representative of the Blackburn Aeroplane Co., Leeds, the Governments of Kenya, Uganda, and the Anglo-Egyptian Sudan have agreed in principle to give assistance in a preliminary survey for an air route between Kisumu, on Victoria Nyanza, and Khartum, which will be the first step in a branch joining the Imperial air route at Cairo.

It is proposed to use eight passenger seaplanes, which will follow the Nile. A large subsidy will be necessary in the first few years, but official assistance is at present confined to the survey.

The Fairey Ambulance Seaplane

THE Fairey IIID ambulance seaplane (Rolls-Royce "Eagle IX") which was sent out to British Guiana some time ago, and which was described in FLIGHT for October 16 last, has, we learn, been carrying out successful flights for its owners, the Real Daylight Balata Co.

New Australian Air Services

NEW air services will be established at an early date connecting Broken Hill, Mildura, and Hay with Melbourne.

Gordon-Bennett Balloon Cup

NINETEEN balloons, representing seven nations, have been entered for the annual Gordon-Bennett Cup contest, which will start from Brussels on June 7. The entries are as follows: Great Britain, France, Belgium, United States, Italy and Spain, three balloons each; Switzerland, one.

THE CURTISS "CARRIER PIGEON"

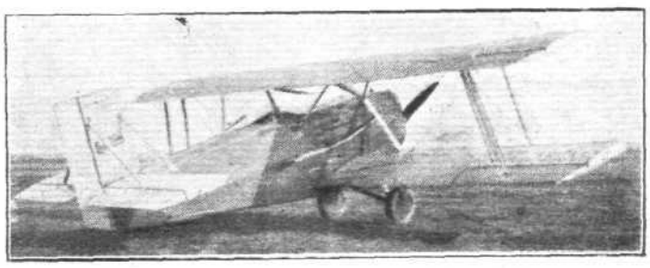
A New Machine Built Specially for Overnight Air Mail Service

ALTHOUGH the U.S. Transcontinental Air Mail Service, especially with the night flying section, has proved to be extraordinarily successful, not only as regards the operation of the service itself, but also on account of the increasing patronage by the public of this very much speedier method of delivering mails, the Post Office Department now find the need for larger, more efficient and safer machines than those at present in use—converted war-type D.H. biplanes. The latter, it must be admitted, have nevertheless given excellent results during the four or five years the U.S. Air Mail Service has been in operation, in spite of the fact that the design of these machines is over eight years old.

With this demand in view, therefore, the Curtiss Aeroplane and Motor Co., of Garden City, N.Y., has designed and produced what is claimed to be the first machine in America specially adapted for air mail work. This machine, which is called the "Carrier Pigeon," will carry half a ton of mail (about 40,000 letters) or parcels. It is intended for operation on the night service between New York and Chicago, which will be inaugurated during the summer of this year. Using the same power plant—the 400 h.p. "Liberty"—it will carry, at a decreased cost and an increased speed, twice the load carried by the present machines. Having a cruising speed of over 100 m.p.h., it will make the trip between New York and Chicago with but one intermediate stop.

The "Carrier Pigeon" is a two-bay tractor fuselage biplane having an exceptionally deep body. Its high speed is about 120 m.p.h., and it will climb at the rate of more than 1,000 ft. per minute, its service ceiling being over 15,000 ft., thus enabling it to surmount with ease high mountain ranges. At the same time, it will land at less than 50 m.p.h. Carrying 117 gals. of fuel, it is capable of flying 500 miles non-stop. Fully loaded, it weighs 2½ tons, of which a little less than a ton may be termed useful load—consisting of 1,000 lbs. of mail, 700 lbs. of fuel, with an allowance of well over 200 lbs. for pilot, parachute and other gear.

A considerable amount of thought and study has been spent in the production of this machine, including conferences with mail service officials and pilots, wind tunnel tests, weight calculations, detailed stress analysis, static lists and work on final choice of detail design. In the design of the "Carrier Pigeon," three important qualities were kept in mind—strength, serviceability, and ease of maintenance, all of which, it would seem, have been realised in the finished product.



Three-quarter rear view of the Curtiss "Carrier Pigeon," 400 h.p. "Liberty."



The Curtiss "Carrier Pigeon": One of the latest products of the Curtiss company, specially designed for overnight air mail work. It is fitted with a 400 h.p. "Liberty" engine, and has a speed range of 50 to 120 m.p.h.

The wings of the "Carrier Pigeon" are of wood and steel construction fabric covered. The upper and the lower wings are so designed that they are interchangeable, no centre wing section being required. The wing spars are of solid routed spruce, with no glued joins to deteriorate. The ribs are on Warren truss design giving a tested strength well over the maximum required in the machine. The factors of safety of the wing structure average 25 per cent. over that required in the design. Not only have the main structural members of the wings been carefully analysed for strength, but also every detail fitting and bolt. This is also true, of course, of all other parts of the structure. "Sidewalk" panels of ample size have been provided on the wings for use in working on the machine and in handling the mail. All movable parts, such as aileron hinges, control joint connections, etc., are provided with bronze pins of ample size to guard against rusting or excessive wear. All interplane and tail struts are made adjustable to assist in the proper line-up of the ship.

The tail surfaces have the same general shape and are similar in construction to the wings. All control surfaces are of such a size as to insure adequate control at all speeds. The factors of safety in the tail, owing to the deep tail surfaces, are unusually high, being in some cases over three times the ultimate required. The rudder, elevators and ailerons are identical, being interchangeable one with the other, reducing the number of spares to a minimum. The right and the left stabiliser are interchangeable, as are the ribs in both the fin and stabiliser. The stabiliser is made adjustable in the air, by a torsion and screw member running in bronze bearings, reducing the maintenance below that usually required in the chain and sprocket type. The tail bracing is all above the stabiliser to preclude the possibility of breakage during getaway.

In order to insure the utmost safety to the crew, the fuselage skeleton and the motor mount have been constructed of welded steel tubing, using a Warren truss construction dispensing with the usual wires, which require periodical adjustment. The mail compartment has been located on the centre of gravity of the aeroplane insuring proper balance at any mail load from 50 lb. to 1,000 lb. The mail compartment is accessible from the side as well as from the top by means of hinged doors of such size as to admit very bulky packages. Loading and unloading of mail has been facilitated to a high degree. In addition to the water-tight mail compartment a private luggage compartment has been provided for the pilot's personal use. It is readily accessible from the ground.

Inspection doors have been provided on either side of the fuselage to permit of easy access to the control system, tail skid, etc .

Special attention has been paid to the design of the landing gear and tail skid. The former uses the rubber "doughnut" type of shock-absorbing medium so popular on the "Hawk" (PW8) 'planes. The gear is decidedly "axleless," as can be seen from the accompanying illustration, and the danger of the axle fouling brush, hay, snow, etc., is, of course, reduced to a minimum. The wheels are oversize. The tail skid proper is a large high-tensile steel tube. It is steerable and sprung to give the easiest possible shock-absorbing qualities.

The engine is the Liberty 12 with all latest improvements. The radiator is the underslung type and fairs directly into the body lines. Shutters controlled from the cockpit are provided. The oil temperature is regulated by the same type of cooler used on all Curtiss service and racing machines. Although not found necessary on Liberty engines, it is considered by the designer to be a desirable feature for an aeroplane requiring the utmost reliability, as is the case in a machine of this type. The petrol tank, located under the mail compartment and also faired into the fuselage lines, is droppable in flight, an insurance against fire in case of an imminent crash. By means of special hood fasteners the cowling over the motor can be completely removed, exposing the interior of the engine compartment, and replaced in less than two minutes.

The petrol and oil-filler caps extend outside the fuselage, being far easier to fill than on an automobile. Special attention has also been paid to all drains. They are so located and of such a size that the ship can be completely drained of all water, petrol, and oil in a few minutes. A 7-quart fire extinguisher piped to the engine compartment is provided. This compartment has been made practically air-tight, ensuring complete smothering in case of a fire. The motor mount is, of course, removable, requiring only disconnection of petrol line, motor controls, and four hinge-pins to remove all the power plant excepting the petrol tank. The petrol lines, wiring and pressure-gauge lines run in a removable tunnel on the outside of the machine, rendering them readily accessible. Doors have been provided in the fire-wall to allow of easy access to water pump, distributor heads, and other parts of the engine.

The seat is made especially for use with a parachute, and in addition is shaped to fit the pilot's body. It is adjustable to accommodate pilots of different sizes. Arm rests, made adjustable, are installed for the comfort of the pilot. The rudder control is by means of pedals with swivelling footrests. The control column can be instantly changed to either stick or wheel control to suit the convenience of the pilot. The aileron control is of the "differential" type, ensuring adequate control even at stalling speeds. The ailerons are also so lined up that each side is an independent unit. The master ailerons are on the top wing, obviating the use of protruding horns on the lower wing, and ensures partial control even though the lower aileron is wiped off. "Alemite" lubrication has been provided on all movable parts, including controls, landing gear, tail skid, etc. The instrument-board is conveniently located and is lighted by both "sky lights" and instrument lights. A petrol level gauge located in the cockpit shows the true level at any time. The pilot's cockpit is raised well above the fuselage, ensuring proper vision in all directions.

The principal characteristics of the "Carrier Pigeon" are :—

Span	39 ft. 1½ ins. (top), 41 ft. 11 ins. (lower).
Chord	6 ft. 6 ins.
Gap	7 ft.
Dihedral (lower)	2°.
Wing section	U.S.A. 27.
Overall length	28 ft. 9½ ins.
Wing area	505 sq. ft.
Area of tail plane	65·5 sq. ft.
,, fin	28·1 sq. ft.
,, ailerons	53·6 sq. ft.
,, elevator	26·8 sq. ft.
,, rudder	13·4 sq. ft.
Weight empty	3,045 lbs.
,, loaded	4,900 lbs.
Weight/sq. ft.	9·78 lbs.
Weight/h.p.	12·29 lbs.
Speed range	50–120 m.p.h.
Climb	1,020 ft./min.
Absolute ceiling	16,700 ft.
Range	630–725 miles, or 8–9 hrs.

Personals.

To be Married

The marriage of Flight-Lieut. IAN E. BRODIE (late R.N.), only son of Mr. and Mrs. W. A. BRODIE, of La Cima, San Remo, and Heathside, Totland Bay, with MARY GONVILLE, youngest daughter of the late Mr. and Mrs. WILLIAM CORISTINE COATES, of Knockanally, Co. Kildare, and niece of Mrs. Brodie, J.P., of Fernhill, Wootton Bridge, will take place on April 15, at St. Edmund's, Wootton, Isle of Wight.

The marriage will take place on Wednesday, April 29, at St. George's, Hanover Square, of Squadron-Leader ARTHUR WILLOUGHBY FALLS GLENNY, M.C., D.F.C., R.A.F., only surviving son of Mr. and Mrs. James Swanzy Glenny, of Glenville, Newry, with AVICE NOEL, only daughter of the late Mr. GEORGE BOYES, formerly Chief Magistrate at Cape Town, and Mrs. Boyes, of 39, Cholmley Gardens, West End Green, Hampstead.

A marriage has been arranged, and will take place shortly, between Air-Commodore C. L. N. NEWALL, C.M.G., C.B.E., A.M., R.A.F., only son of the late Lieut.-Col. W. P. Newall, and OLIVE TENNYSON FOSTER, only daughter of Mrs. FRANCIS STORER EATON, of Boston, U.S.A.

The engagement is announced between ALFRED COOMBE WALL RICHARDS, R.A.F., only son of Mr. FRANK RICHARDS, R.B.A., and Mrs. RICHARDS, of Bournemouth, and ESTHER MARY, third daughter of the Rev. STANLEY H. WOODIN, M.A., and Mrs. WOODIN, of Yarmouth Rectory, Isle of Wight.

Deaths

JOHN CHARLES CECIL (JACK), late R.N.A.S., of Beach Cottage, Fowey, who died suddenly of heart failure after influenza, on March 23, was the only son of the Rev. W. Eastwick and Mrs. Cotes, of Point Neptune, Fowey.

EDWARD JOHN DASHWOOD, R.A.F., who died on March 21, of injuries as the result of a flying accident in the North-West Frontier Territory, was the youngest son of Sir George and Lady Mary Dashwood. His age was 22.

FLYING OFFICER NOEL CECIL HAYTER-HAMES, R.A.F., who died on March 21, the result of a flying accident in Waziristan, India, aged 23, was the younger son of Colvile and Violet Hayter-Hames.

PILOT OFFICER IAN MALCOLM SCOTT, who died on March 25, at Kenley, Surrey, as the result of a flying accident, was the youngest son of the late William Scott, of Stockport. He was in his 21st year.

Items

Lieut. COPPENS, Air Attaché at the Belgian Embassy in London, is making a tour of Africa in an aeroplane presented to him by the King of the Belgians.

Capt. SABLÉ, the Air Attaché at the French Embassy, has been recalled to France on completing his term of office, and left London on April 2, with Mme. Sablé, for Paris. Lieut. J. Bos, Capt. Sablé's successor, has arrived in London.

R.A.F. Flying Accidents

THE Air Ministry regrets to announce that as a result of an accident during fog, a Vickers Virginia of No. 9 Squadron, Manston, landed in the sea off Birchington at 11.00 a.m. on April 7. Pilot Officer Eric Alfred Claude Bushell, the pilot of the aircraft, was slightly injured and No. 362113 A.C.2 Horace Eustace Grellis was seriously injured. Pilot Officer Neil Coull Walker and No. 335778 A.C.1 Ernest Edward Mills, the remaining occupants of the machine, were reported missing, and it is feared that they have been drowned.

As a result of an accident at Leysdown near Eastchurch, to a Bristol Fighter of Armament and Gunnery School, Eastchurch, at 11.20 a.m. on April 8, Pilot Officer Anthony Cecil Carbery Mason, the pilot of the aircraft, was killed.

"CONTROLLITIS"

Croydon Catches the Craze

ALMOST everybody who is anybody in the aviation world was to be seen at Croydon on Wednesday of this week, on the occasion of the demonstration by Mijnheer Fokker of the controllability of his machine at or near stalling angle. As FLIGHT goes to press on Wednesday evening, there is no time to have blocks made, nor any space for a lengthy description of what took place, so that details and illustrations must be reserved for next week's issue.

In the meantime, it can be stated that the demonstration, although highly successful, was somewhat less convincing than it might have been had there been no wind. As it was, the machines could descend vertically by virtue of a wind of some 35-40 m.p.h., and thus it was almost impossible to form a true idea of the real angles at which they were descending.

Just by way of showing that we have in this country machines capable of sinking at angles beyond the stall without falling out of control, the Royal Aircraft Establishment of Farnborough had consented to send Flight-Lieutenant P. W. S. Bulman, M.C., A.F.C., of the Experimental Section of the R.A.E., over on the Avro 504, fitted with slots and ailerons. Bulman made the first flight of the day, as far as stalling flight was concerned, and it was, perhaps, the most "emotioning" performance of all. Facing Plough Lane he leapt into the air and climbed at an alarming angle. Approaching the level crossing, he let the machine hang with its tail down, and slowly sinking towards the ground, without showing any tendency to sideslip or to get into a spin. For about 20 minutes he crossed and re-crossed the aerodrome, at times standing quite still, but obviously constantly under perfect control. His performance was watched with the keenest interest by the spectators, who quite evidently felt greatly relieved at the thought that a British machine was capable of such wonderful control.

The next to go up was Mijnheer Fokker, who had ten press representatives in the cabin and a representative of the R.A.E. in the cockpit next to him. On this flight Fokker repeatedly brought his machine to stalling point, and then let go of the controls, leaving the machine to sink very slowly until it regained a more normal attitude. The same performance was repeated with the engine off, and again there was no apparent tendency for the large monoplane either to drop its nose or to roll over on to a wing tip. Just by way of showing that the machine *would* stall if wanted to, Fokker stalled it once or twice, the drop being of apparently the same suddenness as that of ordinary biplanes. On a second demonstration flight one of the passengers was Air Vice-Marshal Sir Sefton Brancker, who sat next to Fokker in the cockpit. Like the other passengers Sir Sefton was impressed by the machine's performance.

A very humorous touch was added after the "official" demonstration by an old Farman "Goliath" going up and doing all the things that the other two machines had done.



IN THE FOKKER F.VII: This view inside the cabin gives a good idea of the seating arrangement, etc. Owing to the high position of the monoplane wing, the passengers' view is particularly unrestricted.

For more than two minutes it "sat" above the aerodrome absolutely stationary, its light wing loading and the high wind enabling it to do so.



THE LATEST FOKKER F.VII: Fitted with a Napier "Lion" engine; this machine carries 10 passengers.

FLIGHT
AIRCRAFT ENGINEER AND AIRSHIPS

THE ROYAL AIR FORCE

London Gazette, April 7, 1925

The date of appointment of Gp. Capt. L. W. B. Rees, V.C., O.B.E., M.C., A.F.C., as Air Aide-de-Camp to His Majesty the King is Feb. 6, and not as *Gazette*, March 20.

General Duties Branch

The following Cadets are granted permanent commissions as Pilot Officers on successfully passing out of R.A.F. Cadet College, Cranwell :—H. E. Nowell (March 9) ; F. S. O'Hanlon (March 12) ; N. C. Walker (March 17). The following Pilot Officers are promoted to rank of Flying Officer :—P. Jones (Feb. 15) ; E. R. Newbigging (Feb. 23) ; A. H. D. Livock (March 13). The promotion of Flying Officer J. C. Hill to that rank is antedated to June 10, 1924. The following Pilot Officers on probation are confirmed in rank :—E. C. G. Badcock, L. Dalton-Morris, J. A. C. Florence, J. S. Georgeson, E. B. C. Groner, G. D. Harvey, R. G. M. Hill, J. J. Nolan, W. F. Rimmer, C. W. Switzer, J. W. Van der Beeck, A. J. Walker, G. A. Whitehead (March 15); E. H. Newman (March 18). The seniority of Pilot Officer J. J. Nolan in that rank is antedated to March 15, 1923.

The following are transferred to the Reserve :—Class A : Flying Officers H. A. C. Atkinson, D. M. N. Coles, R. G. R. Godby, H. E. Greenberry, J. V. Roberts (March 29). Class C :—Squadron Leader R. C. Lane (April 1).

Pilot Officer C. H. P. Morgan relinquishes his short service commission on account of ill-health (April 1) ; Flying Officer A. R. Farrow (Lt., R.A.), relinquishes his commn. on return to Army duty (March 23).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Air Commodore.—L. E. O. Charlton, C.B., C.M.G., D.S.O., to Air Ministry for special duty ; 10.12.24.

Group Captains.—W. F. MacNeece, C.B.E., D.S.O., D.F.C., to H.Q. Air Defences of Great Britain, for Air staff duties ; 27.4.25. F. V. Holt, C.M.G., D.S.O., to R.A.F. depot whilst attending Senior Officers' war course ; 22.4.25.

Wing Commander.—J. T. Babington, D.S.O., to No. 7 Group H.Q., Andover, for Tech. Staff duties ; 6.4.25.

Squadron Leaders.—N. H. Bottomley, A.F.C., to Air Ministry ; 1.5.25. R. M. Drummond, D.S.O., O.B.E., M.C., to R.A.F. Depot ; 1.5.25. C. H. Keith, to Armament and Gunnery Sch., Eastchurch ; 14.4.25. F. G. D. Hards, D.S.C., D.F.C., to Air Ministry ; 20.4.25. C. E. H. Medhurst, O.B.E., M.C., to R.A.F. Staff College, Andover ; 20.4.25. R. D. Oxland to R.A.F. Depot on transfer to Home Estab. ; 25.3.25. A. A. L. Miller, to R.A.F. Base, Gosport, on appointment to a Temp. Comm. from Navy ; 31.3.24.

Flight Lieutenants.—E. H. Richardson, to R.A.F. Base, Leuchars ; 14.4.25. C. N. Ellen, D.F.C., to No. 7 Group H.Q., Andover ; 17.4.25. W. J. Umpleby to No. 5 Flying Training Sch., Sealand ; 8.4.25. J. P. Coleman, A.F.C., to H.Q. Coastal Area instead of to R.A.F. Depot as previously notified ; 14.4.25. M. D. Nares, A.F.C., to R.A.F. Base, Lauchars ; 6.4.25. J. McFarlane, M.C., to R.A.F. Depot (Non-Effective Pool) ; 4.4.25. ; G. G. Dawson and H. S. Broughall, M.C., D.F.C., to R.A.F. Depot on transfer to Home Estab. ; 25.3.25.

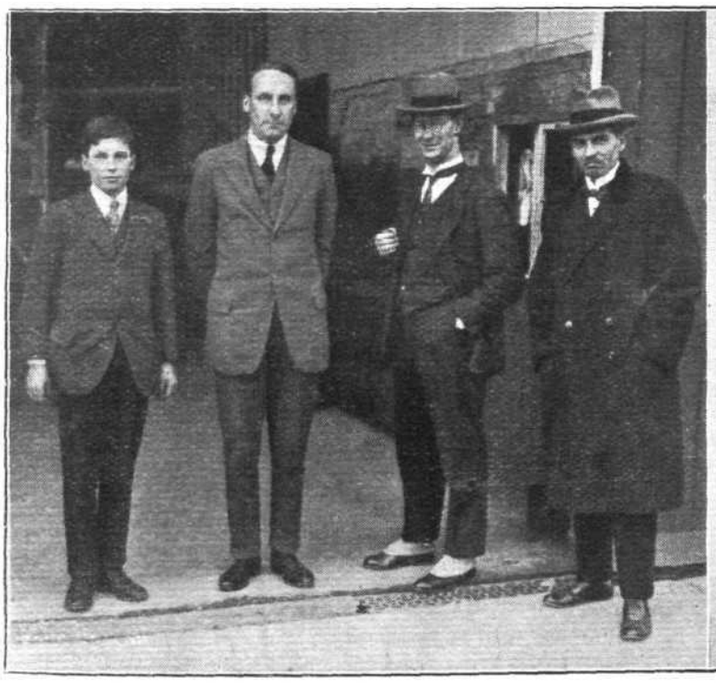
THE INFANTE DON ALFONSO VISITS THE "GLOUCESTERSHIRE" WORKS

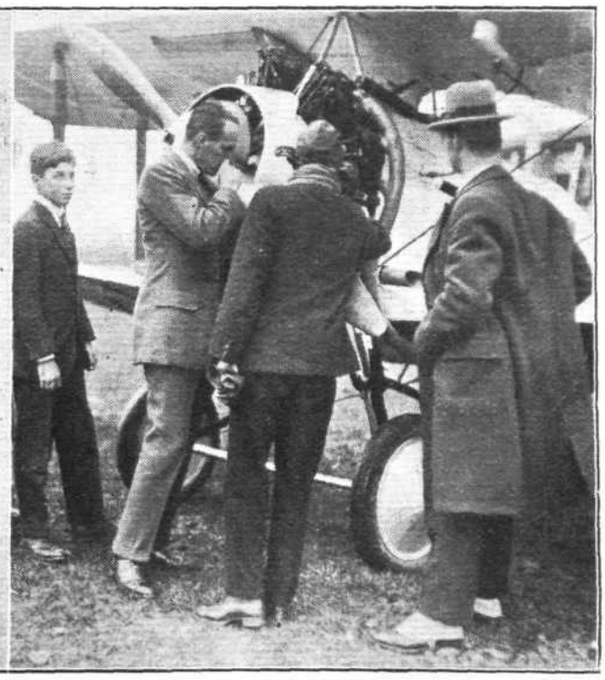
H.R.H. THE INFANTE DON ALFONSO OF SPAIN, accompanied by his son Prince Albert, visited the works of the Gloucestershire Aircraft Company at Cheltenham, on Tuesday, April 7, 1925. The Royal guests left Croydon aerodrome by air at 10.45 a.m., and landed at the "Gloster" aerodrome at Brockworth soon after 12 noon. They were met at the aerodrome by Capt. L. W. Charley and Mr. H. P. Folland, the Chief Engineer and Designer. After receiving an expression of deep regret from the Managing Director, Mr. D. Longden, who was unable to welcome them in person, owing to a sudden illness which had confined him to his bed, they witnessed an excellent demonstration of the famous "Grebe" Single-seater Fighter in the skilful hands of Mr. Larry Carter, the Company's well-known pilot. The Infante being an enthusiastic airman himself and thoroughly abreast of all the latest developments in the aviation world, was already familiar with the excellent flying qualities of the "Grebe" and took the greatest interest in the machine, as also in the new "Grouse II" Intermediary Training Machine with "Lynx" engine.

Their Royal Highnesses were then entertained for lunch by the Directors of the Company at the Lansdown Hotel. After lunch they made a thorough tour of the works, piloted by Mr. H. P. Folland, and evinced a lively interest in every detail of the constructional work, which has won for the "Grebe" its great reputation.

Prince Albert promises to become as keen a supporter of aviation as his father. Though only 15 years of age he displays a very intelligent acquaintance with aircraft, and was no less enthusiastically interested in all that he saw than his father.

Their Royal Highnesses, after expressing great satisfaction with their visit, returned to the aerodrome and left again by air at 5 p.m., arriving at Croydon at 6.10 p.m.





H.R.H. THE INFANTE DON ALFONSO OF SPAIN VISITS THE GLOUCESTERSHIRE AIRCRAFT COMPANY : In the group on the left are seen, from right to left, Capt. L. W. Charley, Mr. H. P. Folland, H.R.H. the Infante, and his son Prince Albert. The right-hand photo. shows the Infante Don Alfonso inspecting the Siddeley "Jaguar" engine of a Gloucestershire "Grebe."

AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

South African Air Posts

Apropos of the formal inauguration of a South African air post service, it may be recalled that nearly fourteen years have elapsed since a series of experimental flights was carried out between Kenilworth and Muizenburg in Cape Province, with the sanction of the Minister of Posts and Telegraphs. The souvenir postcards issued on the occasion of the first South African aerial post are much sought after by air post collectors today, and have recently changed hands for several pounds apiece. Only 2,597 cards were "flown" between December 31, 1911, and January 3, 1912.

Seven years later a series of "Aerial Post" flights were held in aid of Red Cross charities in various parts of South Africa under the auspices of the Royal Flying Corps, when distinctive air postcards were sold bearing the badge of the R.F.C., with a Geneva Cross as a background, and the legend "Make Your Sixpence Fly." These, too, are elusive items for the aero-philatelist of today.

The rarest of all South African air post covers are, however, those carried on the disastrous Handley Page flight from Cape Town to Johannesburg in February, 1920, when the mail 'plane crashed at Beaufort West, and the few score letters had to complete their journey by the more prosaic train route.

Z.R.3 Again

Official figures supplied by the Acting Postmaster of New York City give the total number of letters, etc., received per the airship Z.R.3 on October 15, 1924, as 16,484. All were run through a post-marking machine at the New York Post Office, but it is admitted that a few may possibly have escaped impression.

Zurich-Teheran Flight Covers

A number of air covers are now on the market bearing the inscription "Premier vol postal Zurich-Teheran," franked with Swiss air post stamps and showing the postmarks of both Zurich and Teheran. A total of 280 letters thus franked is said to have been carried by the pilot Mittelholzer on his interrupted flight, but their official status has yet to be determined. According to a Swiss journal, the general public was given no opportunity of transmitting correspondence by the flight in question.

Albanian Air Post

By means of an air-post service operated by the Adria-Aero Lloyd, with headquarters at Tirana, the Albanian capital, it is hoped to effect a saving of a full week in the delivery of mails in the unrestful state. In all, four lines are projected, and special machines have been sent out, capable of crossing the Albanian mountains. Needless to say, a set of air-post stamps has also been provided, surface printed at the State Printing Works, Berlin, in an effective design depicting a passenger 'plane flying over an Albanian town, with a mountain range in the background. These stamps are to be sold on a gold franc basis, in denominations 5 qint yellow-green, 10 q. carmine, 25 q. blue, 50 q. dark green, 1 fr. violet and black, 2 fr. olive and violet, 3 fr. orange and dark green. The initial printing amounts to 50,000 sets complete, but the lower values have been printed to the extent of 150,000 copies.

Swiss Air-Post Club

Helvetia, the scene of so many pioneer air stamps, and the home of some distinguished air-post collectors, is at last to have its own Aero Philatelic Club. A provisional organising committee has been formed by Messrs. Ad. von Arx of Chiasso, whose well-known air-post collection has gained high awards, and M. Rochat, Postfach 11855, Berne II, who is acting as Hon. Secretary *pro tem.* This is the fifth society of air-post collectors to be formed during the past three years.

* * * *

R.A.F. Middle East Dinner

The R.A.F. Middle East Dinner will be held on Thursday, May 28, at the Trocadero Restaurant.

Palmer Tyres in a New Home

Their lease of the Shaftesbury Avenue premises having expired, the Palmer Tyre, Ltd., have now moved to 100-106, Cannon Street, London, E.C.4., where all communications should, from April 9 on, be sent. Their new telephone No. is City 1477 (two lines) and the telegraphic address "Tyricord, Cannon, London."

NOTICES TO AIRMEN

The Workmen's Compensation (Aircraft) Order, 1924

It is notified :—

1. The Workmen's Compensation (Aircraft) Order, 1924, dated December 19, 1924 (S.R.O. 1924, No. 1499), extending the provisions of the Workmen's Compensation Acts to employment on aircraft when outside Great Britain, will come into force on April 1, 1925. A notice to this effect was published in the London and Edinburgh *Gazettes* of 6th instant, in pursuance of paragraph 4 of the Order in question.

2. Copies of the Order are obtainable from the sales offices of His Majesty's Stationery Office or through any bookseller, price 1*d.* net.

(No. 17 of 1925.)

Croydon Aerial Lighthouse : Altered Characteristic

It is notified that :—

1. The lower reflected light of the aerial pilotage light at Croydon aerodrome has been disconnected.

2. The details of this light published on page 34 of the *Air Pilot*, columns 2, 3 and 5, are, therefore, cancelled, and the following substituted :—

Col. 2.—1 white ; group, flashing, 13 secs. (TCE 13-6w 500).

Col. 3.—V. 25 ; C.P. 500,000.

Col. 5.—Situated approximately 255 ft. (78 metres) above sea level ; 15 ft. above ground level. The light is only operated when due notice that an aircraft may arrive between sunset and sunrise has been given to the C.A.T.O., Croydon. A white group flashing light is exhibited every thirteen seconds, as follows :—

Flash 1	second ;	eclipse	1	second.
Flash 1	,,	,,	1	,,
Flash 1	,,	,,	1	,,
Flash 1	,,	,,	1	,,
Flash 1	,,	,,	1	,,
Flash 1	,,	,,	2	seconds.

3. The attention of all pilots is drawn to the fact that owing to the non-operation of the lower unit, the white cone will no longer be visible at night.

(*Confirmation of W/T signal of April* 4, 1925.)

(No. 22 of 1925.)

* * * *

PUBLICATIONS RECEIVED

Vickers News, March, 1925. Vickers, Ltd., Vickers House, Broadway, Westminster, S.W.1. Price 2*d.*, post free 3*d.*

The Air Pilot Monthly Supplement. No. 5 *March*, 1925. Air Ministry, Kingsway, London, W.C.2.

Report on the Health of the Royal Air Force for the Year 1923. *Air Publication* 1103. *February*, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 3*s.* 6*d.* net.

National Physical Laboratory Report for the Year 1924. H.M. Stationery Office, Kingsway, London, W.C.2. Price 8*s.* 6*d.* net.

* * * *

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations : Cyl. = cylinder ; i.c. = internal combustion ; m. = motor
The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published April 16, 1925

31,498. Luftschiffbau Zeppelin Ges. Rigid airships. (230,899.)

APPLIED FOR IN 1924

Published April 16, 1925

3,354. Soc. Dite Bleriot Aeronautique. Girders for aeroplane wings. (211,465.)

5,661. A. G. Forsyth. Induction passages for radial cyl. i.c. engines. (230,984.)

7,915. Lord Invernairn (W. Beardmore) and A.E.L. Chorlton. I.c. engines. (231,000.)

5,001. Soc. Rateau. Electrically-driven fans. (229,708.)

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.
Telegraphic address : Truditur, Westcent, London.
Telephone : Gerrard 1828.

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